CLAIMS

1. A heat exchange refrigerant subcool system that utilizes stored condensate water from an air conditioner, refrigeration or heat pump system or other water supply that is then pumped across a heat exchanger while the cold, dry building exhaust air is passed over said heat exchanger for evaporatively subcooling a liquid refrigerant that has already passed through the condenser of said air conditioner, refrigeration or heat pump system comprising in combination:

   a) a subcooler serially connected in fluid communication with the output of the condenser and input to the evaporator, enabling the refrigerant to flow through said subcooler after first flowing through the condenser;

   b) a reservoir located below the subcooler that receives the condensate discharge from said air conditioner, refrigeration or heat pump and that also receives any needed make up water;

   c) said reservoir connected in fluid communication with the input of a pump that pumps stored condensate and make up water through a control system that enables the correct amount of water to flow across and wet the surface of said subcooler and then back to storage in the reservoir;

   d) said wetted subcooler connected in fluid communication with the cold, dry building exhaust air that subsequently cools by evaporation the water flowing over the subcooler which in turn cools the refrigerant in the subcooler; and

e) a means for said water to overflow to discharge, whereby said subcooler utilizes said evaporative cooling process for providing maximum available subcooling to the liquid refrigerant of an air conditioner, refrigeration or heat pump system.

2. A heat exchange refrigerant subcool system that utilizes stored condensate water from an air conditioner, refrigeration or heat pump system or other water supply that is then pumped across a heat exchanger while the outdoor air is passed over said heat exchanger for evaporatively subcooling a liquid refrigerant that has already passed through the condenser of said air conditioner, refrigeration or heat pump system comprising in combination:

a) a subcooler serially connected in fluid communication with the output of the condenser and input to the evaporator, enabling the refrigerant to flow through said subcooler after first flowing through the condenser;

b) a reservoir located below the subcooler that receives the condensate discharge from said air conditioner, refrigeration or heat pump and that also receives any needed make up water;

c) Said reservoir connected in fluid communication with the input of a pump that pumps stored condensate and make up water through a control system that enables the correct amount of water to flow across and wet the surface of said subcooler and then back to storage in the reservoir;

d) said wetted subcooler connected in fluid communication with the outdoor air that subsequently cools by evaporation the water flowing over the subcooler which in turn cools the refrigerant in the subcooler; and

e) a means for said water to overflow to discharge, whereby said subcooler utilizes said evaporative cooling process for providing maximum available subcooling to the liquid refrigerant of an air conditioner, refrigeration or heat pump system.

3. A heat exchange refrigerant subcool system that utilizes condensate and make up water in a passive, capillary effect feed method, coupled with cold , dry building exhaust air for evaporatively subcooling a refrigerant that has already passed through the condenser of an air conditioner, refrigeration or heat pump system, comprising in combination:.

a) a subcooler serially connected in fluid communication with the output of the condenser, enabling the refrigerant to flow through said subcooler after first flowing through the condenser;

b) the bottom of said subcooler placed in a water storage tank that receives the condensate water from an air conditioner, refrigeration or heat pump and any needed make up water for a capillary feed of said water to wet the surface of said subcool heat exchanger;

c) said wetted subcooler further connected in fluid communication with the cold , dry building exhaust air that subsequently cools the water being fed by

capillary action onto the subcooler, which in turn cools the refrigerant in the subcooler; and

d) a means for said water to overflow to discharge, whereby said subcooler utilizes said evaporative cooling process for providing maximum available subcooling to the liquid refrigerant.

4. A heat exchange refrigerant subcool system that utilizes condensate and make up water in a passive, capillary effect feed method, coupled with outdoor air for evaporatively subcooling a refrigerant that has already passed through the condenser of an air conditioner, refrigeration or heat pump system, comprising in combination:

a) a subcooler serially connected in fluid communication with the output of the condenser, enabling the refrigerant to flow through said subcooler after first flowing through the condenser;

b) the bottom of said subcooler placed in a water storage tank that receives the condensate water from an air conditioner, refrigeration or heat pump and any needed make up water for a capillary feed of said water to wet the surface of said subcool heat exchanger;

c) said wetted subcooler further connected in fluid communication with the outdoor air that subsequently cools the water being fed by capillary action onto the subcooler, which in turn cools the refrigerant in the subcooler; and

d) a means for said water to overflow to discharge, whereby said subcooler utilizes said evaporative cooling process for providing maximum available subcooling to the liquid refrigerant.

5. A heat exchange refrigerant precool system that utilizes the condensate water discharge from an air conditioner, refrigeration or heat pump system and make up water that is then pumped across a heat exchanger while the cold, dry building exhaust air is also passing over said heat exchanger for evaporatively precooling a hot gas refrigerant before said refrigerant passes into the condenser of said air conditioner, refrigeration or heat pump system, comprising in combination:.

a) a precooler serially connected in fluid communication with the output of a compressor and the input of a condenser, enabling the hot gas refrigerant to flow through said precooler before passing into the condenser.

b) A reservoir located beneath the precooler that receives the condensate discharge from said air conditioner, refrigeration or heat pump system and that also receives any needed make-up water;

c) said reservoir connected in fluid communication with the input of a pump that

pumps the stored condensate water through a control system that enables the correct amount of condensate and make-up water to flow across and wet the surface of said precooler and then back to storage;

d) said wetted precooler further connected in fluid communication with cold, dry building exhaust air that subsequently cools by evaporation the water flowing over the precooler which in turn cools the refrigerant in the precooler; and

e) means for said water to overflow to discharge, whereby said precooler utilizes said evaporative cooling process for providing maximum available precooling to the refrigerant before said refrigerant passes into the condenser of said air conditioner, refrigeration or heat pump system.

6. A heat exchange refrigerant precool system that utilizes the condensate water discharge from an air conditioner, refrigeration or heat pump system and make - up water that is then pumped across a heat exchanger while the outdoor air is also passing over said heat exchanger for evaporatively precooling a hot gas refrigerant before said refrigerant passes into the condenser of said air conditioner, refrigeration or heat pump system, comprising in combination:.

a) a precooler serially connected in fluid communication with the output of a compressor and the input of a condenser, enabling the hot gas refrigerant to flow through said precooler before passing into the condenser.

b) a reservoir located beneath the precooler that receives the condensate discharge from said air conditioner,refrigeration or heat pump system and that also receives any needed make-up water;

c) said reservoir connected in fluid communication with the input of a pump that

pumps the stored condensate water through a control system that enables the correct amount of condensate and make-up water to flow across and wet the surface of said precooler and then back to storage;

d) said wetted precooler further connected in fluid communication with outdoor air that subsequently cools by evaporation the water flowing over the precooler which in turn cools the refrigerant in the precooler; and

e) a means for said water to overflow to discharge, whereby said precooler utilizes said evaporative cooling process for providing maximum available precooling to the refrigerant before said refrigerant passes into the condenser of said air conditioner, refrigeration or heat pump system.

7. A heat exchange refrigerant precool system that utilizes the condensate water from an air conditioner, refrigeration or heat pump system and make-up water in a passive, capillary effect feed method, coupled with cold, dry building exhaust air for evaporatively precooling a refrigerant before said refrigerant passes into the condenser of said air conditioner, refrigeration or heat pump system comprising in combination:

a) a precooler serially connected in fluid communication with the output of a

compressor, then to the input of a condenser, enabling the hot gas refrigerant discharge from a compressor to flow through said precooler before passing into the condenser;

b) the bottom of said precooler sitting in a water storage reservoir that receives the condensate water from an air conditioner, refrigeration or heat pump system and any needed make-up water for a capillary action feed of said water into the precool heat exchanger;

c) said precooler further connected in fluid communication with cold, dry building exhaust air that subsequently cools by evaporation the water being fed by capillary action into the precooler which in turn cools the hot gas refrigerant in the precooler; and

d) A means for said condensate and make-up water to overflow to discharge, whereby said precooler utilizes the said evaporative cooling process for providing maximum available precooling to the pre-condenser refrigerant of said air conditioner, refrigeration or heat pump system.

8. A heat exchange refrigerant precool system that utilizes the condensate water from an air conditioner, refrigeration or heat pump system and make-up water in a passive, capillary effect feed method, coupled with outdoor air for evaporatively precooling a refrigerant before said refrigerant passes into the condenser of said air conditioner, refrigeration or heat pump system comprising in combination:

a) a precooler serially connected in fluid communication with the output of a compressor, then to the input of a condenser, enabling the hot gas refrigerant discharge from a compressor to flow through said precooler before passing into the condenser;

b) the bottom of said precooler sitting in a water storage reservoir that receives the condensate water from an air conditioner, refrigeration or heat pump system and any needed make-up water for a capillary action feed of said water into the precool heat exchanger;

c) said precooler further connected in fluid communication with outdoor air that subsequently cools by evaporation the water being fed by capillary action into the precooler which in turn cools the hot gas refrigerant in the precooler; and

d) A means for said condensate and make-up water to overflow to discharge, whereby said precooler utilizes the said evaporative cooling process for providing maximum available precooling to the pre-condenser refrigerant of said air conditioner, refrigeration or heat pump system.

9. A combination subcool and precool heat exchanger system that utilizes the stored condensate water from an air conditioner, refrigeration or heat pump system and any needed make-up water that is first pumped across a first heat exchanger while the cold, dry building exhaust air is also passed over said first heat exchanger for first evaporatively subcooling the liquid refrigerant that has passed through the condenser of said air conditioner, refrigeration or heat pump system and then the air exhausting from the first heat exchanger subsequently

passed through a second water wetted heat exchanger(a precooler) for subsequently precooling the hot gas discharge refrigerant from a compressor before said refrigerant passes into the condenser of said air conditioner, refrigeration or heat pump system comprising in combination:

a) the first heat exchanger, a subcooler serially connected in fluid communication with the output of the condenser and the input to the evaporator, enabling the refrigerant to flow through said subcooler after first flowing through the condenser and then the evaporator;

b) the second heat exchanger, a precooler serially connected in fluid communication with the output of a compressor and the input to the condenser, enabling the hot gas refrigerant to flow from the compressor through said precooler before passing into the condenser;

c) a reservoir system below the subcooler and precooler that receives the condensate and make-up water supplies;

d) said reservoir system connected in fluid communication with the input of a pump that pumps stored condensate and make-up water through a control system that enables the correct amount of condensate and/or make-up water to flow across and wet the surfaces of said subcooler and said precooler;

e) said subcooler further connected in fluid communication with cold, dry building exhaust air that subsequently cools by evaporation the water flowing over the subcooler which in turn cools the liquid refrigerant in the subcooler; and

f) said precooler connected in fluid communication with the airflow output of the subcooler of the previously used building exhaust air, said previously used building exhaust air passing through said condensate and make-up water supply wetted precooler heat exchanger, where said exhaust air cools by evaporation the water flowing over the precooler which in turn precools the hot gas refrigerant flowing through the precooler; and.

g) means for said condensate and make-up water to overflow to discharge, whereby said subcool and precool system utilizes said evaporative cooling for providing maximum available subcooling to the liquid refrigerant and maximum available precooling to the hot gas discharge refrigerant of said air conditioner, refrigeration or heat pump system.

10. A combination subcool and precool heat exchanger system that utilizes the stored condensate water from an air conditioner, refrigeration or heat pump system and any needed make-up water that is first pumped across a first heat exchanger while outdoor air is also passed over said first heat exchanger for first evaporatively subcooling the liquid refrigerant that has passed through the condenser of said air conditioner, refrigeration or heat pump system and then the air exhausting from the first heat exchanger subsequently passed through a second water wetted heat exchanger(a precooler) for subsequently precooling the hot gas discharge refrigerant from a compressor before said refrigerant

passes into the condenser of said air conditioner, refrigeration or heat pump system comprising in combination:

a) the first heat exchanger, a subcooler serially connected in fluid communication

with the output of the condenser and the input to the evaporator, enabling the refrigerant to flow through said subcooler after first flowing through the condenser and then the evaporator;

b) the second heat exchanger, a precooler serially connected in fluid communication with the output of a compressor and the input to the condenser, enabling the hot gas refrigerant to flow from the compressor through said precooler before passing into the condenser;

c) a reservoir system below the subcooler and precooler that receives the condensate and make-up water supplies;

d) said reservoir system connected in fluid communication with the input of a pump that pumps stored condensate and make-up water through a control system that enables the correct amount of condensate and/or make-up water to flow across and wet the surfaces of said subcooler and said precooler;

e) said subcooler further connected in fluid communication with outdoor air that subsequently cools by evaporation the water flowing over the subcooler which in turn cools the liquid refrigerant in the subcooler; and

f) said precooler connected in fluid communication with the airflow output of the subcooler of the previously used building exhaust air,.said previously used

outdoor air passing through said condensate and make-up water supply wetted precooler heat exchanger, where said outdoor air cools by evaporation the water flowing over the precooler which in turn precools the hot gas refrigerant flowing through the precooler; and.

g) means for said condensate and make-up water to overflow to discharge, whereby said subcool and precool system utilizes said evaporative cooling for providing maximum available subcooling to the liquid refrigerant and maximum available precooling to the hot gas discharge refrigerant of said air conditioner, refrigeration or heat pump system.

11. A combination subcool and precool heat exchanger system that utilizes the stored condensate water from an air conditioner, refrigeration or heat pump system and any needed make-up water that is first pumped across a first heat exchanger while the cold, dry building exhaust air is also passed over said first heat exchanger for first evaporatively subcooling the liquid refrigerant that has passed through the condenser of said air conditioner, refrigeration or heat pump system and then the air exhausting from the first heat exchanger subsequently passed through a second water wetted heat exchanger (a precooler) for subsequently precooling the hot gas discharge refrigerant from a compressor before said refrigerant passes into the condenser of said air conditioner, refrigeration or heat pump system comprising in combination:.

a) the first heat exchanger, a subcooler serially connected in fluid communication with the output of the condenser and the input to the evaporator, enabling the refrigerant to flow through said subcooler after first flowing through the condenser and then the evaporator;

b) the second heat exchanger, a precooler serially connected in fluid communication with the output of a compressor and the input to the condenser, enabling the hot gas refrigerant to flow from the compressor through said precooler before passing into the condenser;

c) separate reservoir systems; one each below the subcooler and one below the precooler that receives the condensate and make-up water supplies;

d) said reservoir systems connected in fluid communication with the input of two (2) pumps, one that pumps stored condensate and make-up water through a control system that enables the correct amount of condensate and/or make-up water to flow across and wet the surfaces of said subcooler and one that pumps stored condensate and make-up water through a control system that enables the correct amount of condensate and/or make-up water to flow across and wet the surfaces of said precooler;

e) said subcooler further connected in fluid communication with cold, dry building exhaust air that subsequently cools by evaporation the water flowing over the subcooler which in turn cools the liquid refrigerant in the subcooler; and

f) said precooler connected in fluid communication with the airflow output of the subcooler of the previously used building exhaust air, said previously used building exhaust air passing through said condensate and make-up water supply wetted precooler heat exchanger, where said exhaust air cools by evaporation the water flowing over the precooler which in turn precools the hot gas refrigerant flowing through the precooler; and.

g) means for said condensate and make-up water to overflow to discharge, whereby said subcool and precool system utilizes said evaporative cooling for providing maximum available subcooling to the liquid refrigerant and maximum available precooling to the hot gas discharge refrigerant of said air conditioner, refrigeration or heat pump system.

12. A combination subcool and precool heat exchanger system that utilizes the stored condensate water from an air conditioner, refrigeration or heat pump system and any needed make-up water that is first pumped across a first heat exchanger while outdoor air is also passed over said first heat exchanger for first evaporatively subcooling the liquid refrigerant that has passed through the condenser of said air conditioner, refrigeration or heat pump system and then the air exhausting from the first heat exchanger subsequently passed through a second water wetted heat exchanger (a precooler) for subsequently precooling the hot gas discharge refrigerant from a compressor before said refrigerant

passes into the condenser of said air conditioner, refrigeration or heat pump system comprising in combination:

a) the first heat exchanger, a subcooler serially connected in fluid communication with the output of the condenser and the input to the evaporator, enabling the refrigerant to flow through said subcooler after first flowing through the condenser and then the evaporator;

b) the second heat exchanger, a precooler serially connected in fluid communication with the output of a compressor and the input to the condenser, enabling the hot gas refrigerant to flow from the compressor through said precooler before passing into the condenser;

c) separate reservoir systems; one below the subcooler and one below the precooler that receives the condensate and make-up water supplies;

d) said reservoir systems connected in fluid communication with the input of two (2) pumps, one that pumps stored condensate and make-up water through a control system that enables the correct amount of condensate and/or make-up water to flow across and wet the surfaces of said subcooler and one that pumps stored condensate and make-up water through a control system that enables the correct amount of condensate and/or make-up water to flow across and wet the surfaces of said precooler;

e) said subcooler further connected in fluid communication with outdoor air that subsequently cools by evaporation the water flowing over the subcooler which in turn cools the liquid refrigerant in the subcooler; and

f) said precooler connected in fluid communication with the airflow output of the subcooler of the previously used building exhaust air, said previously used outdoor air passing through said condensate and make-up water supply wetted precooler heat exchanger, where said outdoor air cools by evaporation the water flowing over the precooler which in turn precools the hot gas refrigerant flowing through the precooler; and.

g) means for said condensate and make-up water to overflow to discharge, whereby said subcool and precool system utilizes said evaporative cooling for providing maximum available subcooling to the liquid refrigerant and maximum available precooling to the hot gas discharge refrigerant of said air conditioner, refrigeration or heat pump system.

13. A combination subcool and precool heat exchanger system that utilizes the stored condensate water from an air conditioner, refrigeration or heat pump system and any needed make-up water in a passive, capillary effect method coupled with the use of cold, dry building exhaust air for evaporatively subcooling the liquid refrigerant that has passed through the condenser of said air conditioner, refrigeration or heat pump system and then the air exhausting from the first heat exchanger subsequently passed through a second heat exchanger for precooling the hot gas discharge refrigerant from a compressor before said refrigerant passes into the condenser of said air conditioner, refrigeration or heat pump system comprising in combination:

a) the first heat exchanger, a subcooler serially connected in fluid communication with the output of the condenser and the input to the evaporator, enabling the refrigerant to flow through said subcooler, then to the evaporator after first flowing through the condenser;

b) a second heat exchanger, a precooler serially connected in fluid communication with the output of a compressor and then to the condenser, enabling the hot gas refrigerant discharge from a compressor to flow through said precooler before passing into the condenser;

c) the bottom of said subcooler placed in a first water storage reservoir that receives the discharge of condensate water from said air conditioner, refrigeration or heat pump system and make-up water for a capillary feed of said water into a first heat exchanger (a subcooler) for purposes of evaporative cooling by means of the cold, dry building exhaust air passing over the wetted surfaces of said subcool heat exchanger;

d) means for said water to pass from the first water storage reservoir into a second water storage reservoir where a second heat exchanger(the precooler) is wetted by capillary action;

e) said precooler is connected in fluid communication with the air flow output of the subcool heat exchanger where the previously used building exhaust air passes through the condensate and make-up water wetted precooler heat exchanger where said building exhaust air cools by evaporating the wet

surface of said precooler which in turn precools the hot gas refrigerant passing through the precooler; and

f) means for said condensate and make-up water to overflow to discharge whereby said subcool and precool system utilizes said evaporative cooling for providing maximum available subcooling to the liquid refrigerant and maximum available precooling to the hot gas discharge refrigerant of said air conditioner, refrigeration or heat pump system.

14. A combination subcool and precool heat exchanger system that utilizes the stored condensate water from an air conditioner, refrigeration or heat pump system and any needed make-up water in a passive, capillary effect method coupled with the use of outdoor air for evaporatively subcooling the liquid refrigerant that has passed through the condenser of said air conditioner, refrigeration or heat pump system and then the air exhausting from the first heat exchanger subsequently passed through a second heat exchanger for precooling the hot gas discharge refrigerant from a compressor before said refrigerant passes into the condenser of said air conditioner, refrigeration or heat pump system comprising in combination:

a) the first heat exchanger, a subcooler serially connected in fluid communication with the output of the condenser and the input to the evaporator, enabling the refrigerant to flow through said subcooler, then to the evaporator after first flowing through the condenser;

b) a second heat exchanger, a precooler serially connected in fluid communication with the output of a compressor and then to the condenser, enabling the hot gas refrigerant discharge from a compressor to flow through said precooler before passing into the condenser;

c) the bottom of said subcooler placed in a first water storage reservoir that receives the discharge of condensate water from said air conditioner, refrigeration or heat pump system and make-up water for a capillary feed of said water into a first heat exchanger (a subcooler) for purposes of evaporative cooling by means of the outdoor air passing over the wetted surfaces of said subcool heat exchanger;

d) a means for said water to pass from the first water storage reservoir into a second water storage reservoir where a second heat exchanger(the precooler) is wetted by capillary action;

e) said precooler is connected in fluid communication with the air flow output of the subcool heat exchanger where the previously used outdoor air passes through the condensate and make-up water wetted precooler heat exchanger where said outdoor air cools by evaporating the wet surface of said precooler which in turn precools the hot gas refrigerant passing through the precooler; and

f) a means for said condensate and make-up water to overflow to discharge whereby said subcool and precool system utilizes said evaporative cooling for providing maximum available subcooling to the liquid refrigerant and

maximum available precooling to the hot gas discharge refrigerant of said air conditioner, refrigeration or heat pump system.

15. A combination subcool and precool heat exchanger system that utilizes the stored condensate water from an air conditioner, refrigeration or heat pump system and any needed make-up water coupled with the use of the cold, dry building exhaust air for first evaporatively subcooling the liquid refrigerant that flows out of the condenser of said air conditioner, refrigeration or heat pump system and then using only the air exiting the subcooler to conductively cool a second dry heat exchanger (the precooler), for precooling the hot gas discharge refrigerant from a compressor before said refrigerant passes into the condenser of said air conditioner, refrigeration or heat pump system comprising in combination:

a) the first heat exchanger, a subcooler serially connected in fluid communication between the output of the condenser and the input to the evaporator, enabling the refrigerant to flow through said subcooler, after first flowing through the condenser, and before flowing into the evaporator;

b) a second heat exchanger, a precooler serially connected in fluid communication between the output of a compressor and the inlet to the condenser, enabling the hot gas refrigerant to flow from the compressor then through said precooler and finally into the condenser;

c) said subcooler placed in a water storage reservoir that receives the discharge of condensate water from said air conditioner, refrigeration or heat pump system and any needed make-up water where said water wets the surface of said subcooler and where said surface is cooled evaporatively by means of the cold, dry building exhaust air passing over the wetted surface of said subcool heat exchanger;

d) a means for excess of said condensate and make-up water to overflow to drainage; and

e) said precooler is connected in fluid communication with the air flow output of the subcool heat exchanger where the previously used cold, dry building exhaust air discharging from the evaporatively cooled subcooler passes through a non-wetted surface precooler for conductively cooling the hot gas refrigerant passing through the precool heat exchanger, whereby said subcool and precool system utilizes said available subcooling to the liquid refrigerant and maximum available precooling to the hot gas discharge refrigerant of said air conditioner, refrigeration or heat pump system.

16. A combination subcool and precool heat exchanger system that utilizes the stored condensate water from an air conditioner, refrigeration or heat pump system and any needed make-up water coupled with the use of outdoor air for first evaporatively subcooling the liquid refrigerant that flows out of the condenser of said air conditioner, refrigeration or heat pump system and then

using only the air exiting the subcooler to conductively cool a second dry heat exchanger (the precooler), for precooling the hot gas discharge refrigerant from a compressor before said refrigerant passes into the condenser of said air conditioner, refrigeration or heat pump system comprising in combination:

a) the first heat exchanger, a subcooler serially connected in fluid communication between the output of the condenser and the input to the evaporator, enabling the refrigerant to flow through said subcooler, after first flowing through the condenser, and before flowing into the evaporator;

b) a second heat exchanger, a precooler serially connected in fluid communication between the output of a compressor and the inlet to the condenser, enabling the hot gas refrigerant to flow from the compressor then through said precooler and finally into the condenser;

c) said subcooler placed in a first water storage reservoir that receives the discharge of condensate water from said air conditioner, refrigeration or heat pump system and any needed make-up water where said water wets the surface of said subcooler and where said surface is cooled evaporatively by means of outdoor air passing over the wetted surface of said subcool heat exchanger;

d) a means for excess of said condensate and make-up water to overflow to drainage; and

e) said precooler is connected in fluid communication with the air flow output of the subcool heat exchanger where the previously used outdoor air discharging

from the evaporatively cooled subcooler passes through a non-wetted surface precooler for conductively cooling the hot gas refrigerant passing through the precool heat exchanger, whereby said subcool and precool system utilizes said available subcooling to the liquid refrigerant and maximum available precooling to the hot gas discharge refrigerant of said air conditioner, refrigeration or heat pump system.

17. A heat exchange refrigerant postheat system that utilizes relatively warm building exhaust air for adding extra heat to the evaporator side of a heat pump system comprising in combination:

a) a postheater serially connected in fluid communication with the output of a heat pump, operating in the heating mode, evaporator and the input to the compressor, enabling the hot gas refrigerant discharge from the evaporator to flow through said postheater before passing into the compressor;

b) said postheater further connected in fluid communication with the relatively warm building exhaust air that subsequently warms the refrigerant passing through said postheater, whereby said postheater utilizes the relatively warm building exhaust air to provide maximum postheating of the refrigerant of said heat pump system operating in the heating mode.

18. A combination subcool and postheat heat exchanger system that utilizes building exhaust air to first subcool the liquid refrigerant that flows out of the

condenser of a heat pump system operating in the heating mode and then reuses the subcooler warmed (building exhaust)air to add heat to the refrigerant passing through the postheat heat exchanger from the primary evaporator to the compressor of said heat pump system comprising in combination:

a) the first heat exchanger, a subcooler serially connected in fluid communication with the output of the condenser and the input to the evaporator, enabling the refrigerant to flow through said subcooler, then to the evaporator after first flowing through the condenser;

b) a second heat exchanger, a postheater serially connected in fluid communication with the output of an evaporator and the input of the compressor, enabling the refrigerant to flow through said postheater, then to the compressor after first flowing through the evaporator;

c) said subcooler connected in fluid communication with relatively cool building exhaust air that subsequently cools by conduction the subcooler which in turn cools the liquid refrigerant flowing through the subcooler and which in turn warms the air passing through the subcooler;

d) said postheater connected in serial communication with the airflow output of the subcooler of the previously used and subsequently warmed building exhaust air where said relatively warm air supply finishes evaporating and warming the refrigerant flowing through the postheater whereby said subcool and postheat system utilizes the building exhaust air for providing maximum available subcooling to the liquid refrigerant and maximum available

postheating to the refrigerant passing through said postheater of said heat pump system operating in the heating mode.

19. A combination subcool and postheat heat exchanger system that utilizes outdoor air to first subcool the liquid refrigerant that flows out of the condenser of a heat pump system operating in the heating mode and then reuses the subcooler warmed air to add heat to the refrigerant passing through the postheat heat exchanger from the primary evaporator to the compressor of said heat pump system comprising in combination:

a) the first heat exchanger, a subcooler serially connected in fluid communication

with the output of the condenser and the input to the evaporator, enabling the refrigerant to flow through said subcooler, then to the evaporator after first flowing through the condenser;

b) a second heat exchanger, a postheater serially connected in fluid communication with the output of an evaporator and the input of the compressor, enabling the refrigerant to flow through said postheater, then to the compressor after first flowing through the evaporator;

c) said subcooler connected in fluid communication with cold outdoor air that subsequently cools by conduction the subcooler which in turn cools the liquid refrigerant flowing through the subcooler and which in turn warms the air passing through the subcooler;

d) said postheater connected in serial communication with the airflow output of the subcooler of the previously used and subsequently warmed cold outdoor air where said relatively warm air supply finishes evaporating and warming the refrigerant flowing through the postheater whereby said subcool and postheat system utilizes the outdoor air for providing maximum available subcooling to the liquid refrigerant and maximum available postheating to the refrigerant passing through said postheater of said heat pump system operating in the heating mode.

20. A heat exchange refrigerant subcool system that utilizes relatively cold, building exhaust air passing over a subcooler to conductively subcool a liquid refrigerant that has already passed through the condenser of said air conditioner, refrigeration or heat pump system comprising in combination:

a) a subcooler serially connected in fluid communication with the output of the condenser and input to the evaporator, enabling the refrigerant to flow through said subcooler after first flowing through the condenser; and

b) said subcooler connected in fluid communication with the relatively cold building exhaust air that subsequently cools by conduction the subcooler which in turn cools the liquid refrigerant in the subcooler, whereby said subcooler utilizes said conductive cooling process for providing maximum available subcooling to the liquid refrigerant of an air conditioner, refrigeration or heat pump system.

21. A heat exchange refrigerant precool system that utilizes relatively cold building exhaust air by passing said building exhaust air over said precool heat exchanger for conductively precooling a hot gas refrigerant before said hot gas refrigerant passes into the condenser of said air conditioner, refrigeration or heat pump system, comprising in combination:

a) a precooler serially connected in fluid communication with the output of a compressor and the input of a condenser, enabling the hot gas refrigerant to flow through said precooler before passing into the condenser;

b) said precooler further connected in fluid communication with relatively cold building exhaust air that subsequently cools by conduction the precooler which in turn precools the refrigerant flowing through said precooler.

22. A combination subcool and precool heat exchanger system that utilizes relatively cold building exhaust air for first conductively subcooling the liquid refrigerant that has passed through the condenser of said air conditioner, refrigeration or heat pump system and then the air exhausting from the first heat exchanger subsequently passing through a second heat exchanger for conductively precooling the hot gas discharge refrigerant from a compressor before said refrigerant passes into the condenser of said air conditioner, refrigeration or heat pump system comprising in combination:

a) the first heat exchanger, a subcooler serially connected in fluid communication between the output of the condenser and the input to the evaporator, enabling the refrigerant to flow through said subcooler, then to the evaporator, after first flowing through the condenser;

b) a second heat exchanger, a precooler serially connected in fluid communication between the output of a compressor and then to the condenser, enabling the hot gas refrigerant discharge from a compressor to flow through said precooler before passing into the condenser;

c) said subcooler placed in an enclosed duct system that receives the discharge of cold building exhaust air so that said air supply passes through the first heat exchanger (a subcooler) for purposes of conductively cooling by means of the cold building exhaust air passing over the surfaces of said subcool heat exchanger;

d) said precooler connected in fluid communication with the air flow output of the subcool heat exchanger where the previously used cold building exhaust air passes through the precooler heat exchanger where said cold building exhaust air cools by conduction the surface of said precooler which in turn precools the hot gas refrigerant passing through the precooler.

23. A method for evaporative cooling of an incoming air supply including outdoor air or exhaust building air with condensate water or make-up water, comprising at least one of the steps of:

(a) using evaporatively cooled air to subcool the liquid refrigerant passing through an air to refrigerant heat exchanger after the liquid refrigerant has exited a primary condensing heat exchanger, or;

(b) reusing the evaporatively cooled air after exiting a subcooler heat exchanger to precool the refrigerant hot gas in an air to refrigerant heat exchanger after the hot gas refrigerant exits the compressor but before the hot gas refrigerant enters the primary condensing heat exchanger.

24. A method for evaporatively cooling of incoming air supply including outdoor air or exhaust building air with condensate water or make-up water, comprising at least one of the steps of:

(a) passing evaporatively cooled air across a wetted subcooler heat exchanger, or;

(b) reusing air exiting a subcooler heat exchanger by subsequently passing said reused air across a wetted precooler heat exchanger.

25. A method for evaporatively cooling of incoming air supply including outdoor air or exhaust building air with condensate water or make-up water while simultaneously evaporatively cooling said water supply, comprising at least one of the steps of:

(a) reusing the evaporatively cooled air after exiting the subcooler heat exchanger to precool the refrigerant hot gas in an air to refrigerant heat exchanger after the hot gas refrigerant exits the compressor but before the refrigerant gas enters the primary condensing heat exchanger, or;

(b) evaporatively cooling the air exiting the subcooler heat exchanger then using this two-stage eveporatively cooled air to precool the refrigerant hot gas in an air to refrigerant heat exchanger after the hot gas refrigerant exits the compressor or before the refrigerant gas enters the primary condensing heat exchanger, or;

(c) reusing air exiting subcooler heat exchanger by subsequently passing said air across a wetted precooler heat exchanger.